

Ad 27. (once amended) An outboard motor engine in accordance with Claim 21 wherein said at least one air inlet pipe and said at least one tuning tube are integrally formed.

28. (once amended) An outboard motor engine in accordance with Claim 27 wherein said air inlet pipe and said at least one tuning tube comprise an air intake manifold.

Remarks

The Office Action mailed October 19, 2001 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-30 are now pending in this application. Claims 1-30 stand rejected.

The specification has been amended to correct typographical errors therein.

The objection to the drawings under 37 CFR 1.83(a) is respectfully traversed.

It is respectfully submitted that the recited limitations of the present claims are illustrated in the present figures in full accordance with 37 CFR 1.83(a). The office action does not indicate any recited feature that is not shown, but rather suggests that more detailed illustrations are required.

It is believed that the recited details of the present claims are illustrated in sufficient detail as to be readily appreciated by those in the art to make and practice the invention. Air intake manifolds are submitted to be readily appreciated and within the purview of those in the art without specific illustration thereof, and thus the schematic illustration of the same is submitted to be appropriate in the present case. Figures 2-5 and the accompanying description found in the present specification clearly and in much detail describe different exemplary embodiments of air intake silencers including tuning tubes. Figures 6-8 schematically illustrate a motor cover including such silencers, and as repeatedly noted in the instant specification, the respective silencers schematically shown in Figures 6-8 may be any one of the exemplary embodiments shown in Figures 2-5 in various locations relative to the cover. As such, it is not

believed that additional or amended drawings are necessary for a complete understanding of the subject matter sought to be patented.

For at least these reasons, Applicants submit that the present Figures are in full accord with the Patent Rules and accepted patent practice. Accordingly, Applicants respectfully request that the objections to the drawings be withdrawn.

The rejection of Claims 1-30 under 35 U.S.C. § 112 is respectfully traversed. The claims have been amended to clarify the invention in response to the noted formalities in the claims. Applicants accordingly respectfully request that the Section 112 rejections of Claims 1-30 be withdrawn.

The rejection of Claims 1-5, 7 and 8 under 35 U.S.C. § 102(b) as being anticipated by JP 60-022021 is respectfully traversed.

JP 60-022021 describes a engine including an air intake pipe (12) open to the atmosphere at a first end (13a). Tubular communicating members (15), (16) are connected to intake pipe (12) to establish flow communication with respective resonance chambers (17), (18). Resonance chambers (17), (18) are connected to one another via a connecting pipe (19), and a valve (21) is disposed in connecting pipe (19) and actuated to obtain a resonant frequency in the chambers equal to the dominant frequency of engine intake noise. See JP 60-022021 Abstract and Figures.

It is therefore submitted that JP 60-022021 is the type of silencer noted in the Background of the Invention section of the present application, namely, a system including resonant chambers for noise attenuation. Applicant notes that the effectiveness of such a system is dependent primarily upon the enclosed space, or volume, of the resonant chambers rather than a path length between the air intake and the resonant chambers. It is respectfully submitted that JP 60-022021 does not fairly describe an air intake silencer including a tuning tube as set forth in the instant specification and claims.

Claim 1 recites an air intake silencer including “at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough” and “at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

For the reasons set forth above, JP 60-022021 neither describes nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, JP 60-022021 describes a conventional silencer including resonant chambers of a selected volume to attenuate engine noise.

For at least these reasons, Claim 1 is submitted to be patentable over JP 60-022021.

Claims 2-5, 7, and 8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-5, 7, and 8 are considered in combination with the recitations of Claim 1 Applicants submit that dependent Claims 2-5, 7, and 8 likewise are patentable over JP 60-022021.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-5, 7 and 8 as unpatentable over JP 60-022021 be withdrawn.

The rejection of Claims 1-3 and 5-8 under 35 U.S.C. § 102(b) as being anticipated by JP 03-229908 is respectfully traversed.

JP 03-229908 describes an engine including an air intake pipe (6) opening to a resonance chamber (1) through an opening (12). A partition (31) divides resonance chamber (1) into first and second portions, and the first and second resonance chamber portions communicate with one another through a connection passage (3) formed in partition (31). A disk-like seal member (4)

is disposed within a connecting passage (3) and regulates flow between the resonant chamber portions through a negative pressure source (54). See JP 03-229908 Abstract and Figures.

It is therefore submitted that JP 03-229908 is the type of silencer noted in the Background of the Invention section of the present application, namely, a system including resonant chambers for noise attenuation. Applicant notes that the effectiveness of such a system is dependent primarily upon the enclosed space, or volume, of the resonant chambers rather than a path length between the air intake and the resonant chambers. It is respectfully submitted that JP-03-229908 does not fairly describe an air intake silencer including a tuning tube as set forth in the instant specification and claims.

Claim 1 recites an air intake silencer including "at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough" and "at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe."

For the reasons set forth above, JP 03-229908 neither describes nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, JP 03-229908 describes a conventional silencer including a resonant chambers of a selected volume to attenuate noise.

For the reasons set forth above, Claim 1 is submitted to be patentable over JP 03-229908.

Claims 2, 3, and 5-8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2, 3, and 5-8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2, 3, and 5-8 likewise are patentable over JP 03-229908.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-3 and 5-8 as unpatentable over JP 03-229908 be withdrawn.

The rejection of Claims 1, 2 and 5-8 under 35 U.S.C. § 102(b) as being anticipated by JP 05-163925 is respectfully traversed.

JP 05-163925 describe an automotive resonance muffler chamber (2) formed in a cylindrical vessel and fitted to an outer perimeter of an air intake duct (1). A partition plate (6) divides resonance chamber (2) into a first chamber (2a) and a second chamber (2b). An opening (7) facilitates communication between chambers (2a) and (2b). See JP 05-163925 Abstract and Figures.

It is therefore submitted that JP 05-163925 is the type of silencer noted in the Background of the Invention section of the present application, namely, a system including resonant chambers for noise attenuation. Applicant notes that the effectiveness of such a system is dependent primarily upon the enclosed space, or volume, of the resonant chambers rather than a path length between the air intake and the resonant chambers. It is respectfully submitted that JP 05-163925 does not fairly describe an air intake silencer including a tuning tube as set forth in the instant specification and claims.

Claim 1 recites an air intake silencer including "at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough" and "at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe."

For the reasons set forth above, JP 05-163925 neither describes nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe.

Rather, JP 05-163925 describes a conventional silencer including resonant chambers of a selected volume to attenuate noise.

For the reasons set forth above, Claim 1 is submitted to be patentable over JP 05-163925.

Claims 2 and 5-8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2 and 5-8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2 and 5-8 likewise are patentable over JP 05-163925.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1, 2 and 5-8 as unpatentable over JP 05-163925 be withdrawn.

The rejection of Claims 1-5, 7 and 8 under 35 U.S.C. § 102(b) as being anticipated by JP 60-022021 is traversed as set forth above. The rejection is set forth in duplicate in the Office Action in paragraphs 5 and 8, and for this reason the second rejection is submitted to be in error. Accordingly, Applicants request that this rejection be withdrawn.

The rejection of Claims 1, 3, 5, 7-11, 14, 16, 18, 21, 23, 25, 28, and 29 under 35 U.S.C. § 102(b) as being anticipated by Nakayasu et al. (U.S. Patent No. 5,660,571) is respectfully traversed.

Nakayasu et al. describe two embodiments of an external silencing device for a marine propulsion engine. In the first embodiment depicted in Figure 1, a silencing device (31) includes first and second expansion chambers (34) and (37) formed into a part of a watercraft transom (12). Air is drawn from an air inlet opening (39) into expansion chamber (37), through another opening (35) into expansion chamber (34), and through another opening (42) to an engine intake duct (41). See Nakayasu et al. col. 3, lines 13-51.

In the second embodiment depicted in Figure 2, Nakayasu et al. describe an external silencing device (55) formed in a transom of a watercraft. Silencing device (55) includes three expansion chambers (59), (61), (62) in communication with an atmospheric air intake duct (63) that may be tuned for length to provide a silencing effect in addition to expansion chambers (59), (61), (62). A tuning neck (65) communicates expansion chamber (62) with a fourth expansion chamber (64), and an outlet duct (66) communicates with a conduit (67) that ultimately delivers air to the engine. See Nakayasu et al. col. 3, line 51 to col. 4, line 33.

Nakayasu et al. state that “[t]he volume of the expansion chamber 64 and the length and diameter of tuning necks 65” attenuate sound through the device. Nakayasu et al. col. 4, lines 15-17. Therefore, the silencer described by Nakayasu et al. is submitted to be the type of silencer noted in the Background of the Invention section of the present application, namely, a system including resonant chambers for noise attenuation that depend primarily on a volume of the expansion chambers to attenuate noise rather than upon a selected path length to cancel noise.

Further, both embodiments described by Nakayasu et al. describe a single flow path from an intake duct through a series of expansion chambers and from the expansion chambers to another duct coupled to the engine and vice versa. As such, sound traveling through the intake duct is not diverted and returned to the intake duct, and noise passing through the intake duct is not cancelled in the intake duct. Rather, engine noise is attenuated in the expansion chambers before it enters the intake duct.

from attenuation provided at [65]

Claim 1 recites an air intake silencer including “at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough” and “at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

For the reasons set forth above, Nakayasu et al. neither describes nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending

for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, Nakayasu et al. describe the use of expansion chambers to attenuate engine sounds before reaching the intake duct.

For the reasons set forth above, Claim 1 is submitted to be patentable over Nakayasu et al.

Claims 3, 5, 7 and 8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 3, 5, 7 and 8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 3, 5, 7 and 8 likewise are patentable over Nakayasu et al.

Claim 9 recites a cover for an outboard motor including a lower cover, an upper cover configured for attachment to said lower cover, and "at least one air intake silencer attached to one of said upper cover and said lower cover and comprising at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough, and at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe."

Nakayasu et al. neither describe nor suggest a cover for an outboard motor including an inlet pipe including a tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe. Rather, Nakayasu et al. describe the use of expansion chambers in the transom of a boat to attenuate engine sounds in a continuous flow path from the engine through a series of expansion chambers to attenuate noise in the expansion chambers before reaching the air intake duct.

For the reasons set forth above, Claim 9 is submitted to be patentable over Nakayasu et al.

Claims 10-11, 14, 16, and 18 depend, directly or indirectly, from independent Claim 9. When the recitations of Claims 10-11, 14, 16, and 18 are considered in combination with the recitations of Claim 9, Applicants submit that dependent Claims 10-11, 14, 16, and 18 likewise are patentable over Nakayasu et al.

Claim 21 recites an outboard motor engine including “at least one air inlet for engine intake air,” and “an air intake silencer coupled to said air inlet, said air intake silencer comprising at least one air inlet pipe coupled to said air inlet and at least one tuning tube in flow communication with said air inlet pipe, said air inlet pipe and said tuning tube configured to cancel a portion of sound traveling through said air inlet pipe.”

Nakayasu et al. neither describe nor suggest an outboard engine including an air intake silencer comprising at least one air inlet pipe coupled to an air inlet and at least one tuning tube in flow communication with the air inlet pipe, the air inlet pipe and the tuning tube configured to cancel a portion of sound traveling through the air inlet pipe. Rather, Nakayasu et al. describe an external silencer device including expansion chambers in the transom of a boat to attenuate engine sounds in a continuous flow path from the engine to silencing expansion chambers and ultimately to an air intake duct. As such, engine noise is attenuated before ever reaching the air intake duct.

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For the reasons set forth above, Claim 21 is submitted to be patentable over Nakayasu et al.

Claims 23, 25, 28 and 29 depend, directly or indirectly, from independent Claim 21. When the recitations of Claims 23, 25, 28 and 29 are considered in combination with the recitations of Claim 21, Applicants submit that dependent Claims 23, 25, 28 and 29 likewise are patentable over Nakayasu et al.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1, 3, 5, 7-11, 14, 16, 18, 21, 23, 25, 28, and 29 as unpatentable over Nakayasu et al. be withdrawn.

The rejection of Claims 1-5, 8-18, 21-25 and 28-30 under 35 U.S.C. § 102(b) as being anticipated by Kiekhaefer. (U.S. Patent No. 2,798,470) is respectfully traversed.

Kiekhaefer describes a carburetor air inlet silencer integrally constructed with a cowl (3) of an internal combustion engine. Specifically, a power head (2) includes a carburetor (17) having an air inlet (17). Cowl (3) includes an upper part lower part (4) and an upper part (7) that encase power head (2) within a chamber (5) and also define a silencing chamber (15). A tubular member (36) extends between a flange (14) and connects chamber (5) and expansion chamber (15), and tubular member (36) has a length that is a function of the volume of expansion chamber (15). The volume of expansion chamber (36) is calculated by known formulas for optimum muffling characteristics. See Kiekhaefer col. 1, line 60 to col. 2, line 43 and col. 3, lines 9-28. Moreover, air enters chamber (5) through an opening (10) in cowling lower part (4), from chamber (5) to chamber expansion chamber (15) through tubular member (36), and from expansion chamber (15) to the carburetor inlet (21).

Thus, any sound attenuation in the silencer described by Kiekhaefer is attributable to expansion chamber volume and a tubular member having a length that is a function of that volume rather than a tuning tube having a selected path length to cancel noise as set forth in the instant specification and claims. Further, the silencer has no apparent inlet pipe at all, but rather an opening into a chamber surrounding a power head, and an expansion chamber in communication with the carburetor inlet. Consequently, the silencer described by Kiekhaefer does not cancel noise passing through an air inlet pipe.

Claim 1 recites an air intake silencer including “at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough” and “at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

For the reasons set forth above, Kiekhaefer neither describes nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, Kiekhaefer describes an expansion chamber for attenuating engine noise, and fails to describe an air inlet pipe at all as air is introduced directly into a chamber surrounding the engine through an opening in a cowl surrounding the engine.

For the reasons set forth above, Claim 1 is submitted to be patentable over Kiekhaefer.

Claims 2-5 and 8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-5 and 8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-5 and 8 likewise are patentable over Kiekhaefer.

Claim 9 recites a cover for an outboard motor including a lower cover, an upper cover configured for attachment to said lower cover, and “at least one air intake silencer attached to one of said upper cover and said lower cover and comprising at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough, and at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

Kiekhaefer neither describes nor suggests a cover for an outboard motor including an inlet pipe including a tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing

through the inlet pipe. Rather, Kiekhaefer describes an expansion chamber for attenuating engine noise, and fails to describe an air inlet pipe at all as air is introduced directly into a chamber surrounding the engine through an opening in a cowl surrounding the engine.

For the reasons set forth above, Claim 9 is submitted to be patentable over Kiekhaefer.

Claims 10-18 depend, directly or indirectly, from independent Claim 9. When the recitations of Claims 10-18 are considered in combination with the recitations of Claim 9, Applicants submit that dependent Claims 10-18 likewise are patentable over Kiekhaefer.

Claim 21 recites an outboard motor engine including “at least one air inlet for engine intake air,” and “an air intake silencer coupled to said air inlet, said air intake silencer comprising at least one air inlet pipe coupled to said air inlet and at least one tuning tube in flow communication with said air inlet pipe, said air inlet pipe and said tuning tube configured to cancel a portion of sound traveling through said air inlet pipe.”

Kiekhaefer neither describes nor suggests an outboard engine including an air intake silencer comprising at least one air inlet pipe coupled to an air inlet and at least one tuning tube in flow communication with the air inlet pipe, the air inlet pipe and the tuning tube configured to cancel a portion of sound traveling through the air inlet pipe. Rather, Kiekhaefer describes an expansion chamber for attenuating engine noise, and fails to describe an air inlet pipe at all as air is introduced directly into a chamber surrounding the engine through an opening in a cowl surrounding the engine.

For the reasons set forth above, Claim 21 is submitted to be patentable over Kiekhaefer.

Claims 22-25 and 28-30 depend, directly or indirectly, from independent Claim 21. When the recitations of Claims 22-25 and 28-30 are considered in combination with the recitations of Claim 21, Applicants submit that dependent Claims 22-25 and 28-30 likewise are patentable over Kiekhaefer.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-5, 8-18, 21-25 and 28-30 as unpatentable over Kiekhaefer. be withdrawn.

The rejection of Claims 1-5, 7, 8-12, 16-18, 20, 21, 23, 24, 25, 27 and 29 under 35 U.S.C. § 103 as being unpatentable over Mondek (U.S. Patent No. 5,129,847) in view of JP 60-022021 is respectfully traversed.

Mondek describes a combustion air induction device for a marine propulsion unit including a shroud enclosing an engine and a duct having a first end communicating with the shroud and a second end adapted for connection to a transom of a boat for drawing combustion air from an interior of the boat. Mondek does not describe a silencer apparatus for the induction device.

As noted above, JP 60-022021 describes a engine including an air intake pipe (12) open to the atmosphere at a first end (13a). Tubular communicating members (15), (16) are connected to intake pipe (12) to establish flow communication with respective resonance chambers (17), (18). Resonance chambers (17), (18) are connected to one another via a connecting pipe (19), and a valve (21) is disposed in connecting pipe (19) and actuated to obtain a resonant frequency in the chambers equal to the dominant frequency of engine intake noise.

As such, it is submitted that JP 60-022021 is the type of silencer noted in the Background of the Invention section of the present application, namely, a system including resonant chambers for noise attenuation. Applicant notes that the effectiveness of such a system is dependent primarily upon the enclosed space, or volume, of the resonant chambers rather than a path length between the air intake and the resonant chambers. It is respectfully submitted that Mondek in view of JP 60-022021 do not describe or suggest the air silencer as described in the instant specification and as recited in the present claims.

Claim 1 recites an air intake silencer including “at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough” and “at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

Mondek in view of JP 60-022021 neither describe nor suggest an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, Mondek describes an engine shroud including an air intake duct, and JP-60-022021 describes resonant chambers in flow communication with an air intake for attenuating noise within the volume of the resonant chambers. Neither Mondek nor JP-60-022021 describe or suggest cancellation of noise within an air intake pipe.

For the reasons set forth above, Claim 1 is submitted to be patentable over Mondek in view of JP 60-022021.

Claims 2-5, 7 and 8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2-5, 7 and 8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-5, 7 and 8 likewise are patentable over Mondek in view of JP 60-022021.

Claim 9 recites a cover for an outboard motor including a lower cover, an upper cover configured for attachment to said lower cover, and “at least one air intake silencer attached to one of said upper cover and said lower cover and comprising at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough, and at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

Mondek in view of JP 60-022021 neither describe nor suggest an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, Mondek describes an engine shroud including an air intake duct, and JP 60-022021 describes resonant chambers in flow communication with an air intake for attenuating noise within the volume of the resonant chambers. Neither Mondek nor JP 60-022021 describe or suggest cancellation of noise within an air intake pipe.

Claim 9 is therefore submitted to be patentable over Mondek in view of JP 60-022021.

Claims 10-12, 16-18 and 20 depend, directly or indirectly, from independent Claim 9. When the recitations of Claims 10-12, 16-18 and 20 are considered in combination with the recitations of Claim 9, Applicants submit that dependent Claims 10-12, 16-18 and 20 likewise are patentable over Mondek in view of JP 60-022021.

Claim 21 recites an outboard motor engine including “at least one air inlet for engine intake air,” and “an air intake silencer coupled to said air inlet, said air intake silencer comprising at least one air inlet pipe coupled to said air inlet and at least one tuning tube in flow communication with said air inlet pipe, said air inlet pipe and said tuning tube configured to cancel a portion of sound traveling through said air inlet pipe.”

Mondek in view of JP 60-022021 neither describe nor suggest an outboard engine including an air intake silencer comprising at least one air inlet pipe coupled to an air inlet and at least one tuning tube in flow communication with the air inlet pipe, the air inlet pipe and the tuning tube configured to cancel a portion of sound traveling through the air inlet pipe. Rather, Mondek describes an engine shroud including an air intake duct, and JP 60-022021 describes resonant chambers in flow communication with an air intake for attenuating noise within the volume of the resonant chambers. Neither Mondek nor JP 60-022021 describe or suggest cancellation of noise within an air intake pipe.

For the reasons set forth above, Claim 21 is submitted to be patentable over Mondek in view of JP 60-022021.

Claims 23, 24, 25, 27 and 29 depend, directly or indirectly, from independent Claim 21. When the recitations of Claims 23, 24, 25, 27 and 29 are considered in combination with the recitations of Claim 21, Applicants submit that dependent Claims 23, 24, 25, 27 and 29 likewise are patentable over Mondek in view of JP 60-022021.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1-5, 7, 8-12, 16-18, 20, 21, 23, 24, 25, 27 and 29 as being unpatentable over Mondek (U.S. Patent No. 5,129,847) in view of JP 60-022021 be withdrawn.

The rejection of Claims 1-3, 5-12, 16, 18-21, 23, 25-27 and 29 under 35 U.S.C. § 103 as being unpatentable over Mondek in view of JP 03-229908 is respectfully traversed.

Mondek describes a combustion air induction device for a marine propulsion unit including a shroud enclosing an engine and a duct having a first end communicating with the shroud and a second end adapted for connection to a transom of a boat for drawing combustion air from an interior of the boat. Mondek does not describe a silencer apparatus for the induction device.

As set forth above, JP 03-229908 describes an engine including an air intake pipe (6) opening to a resonance chamber (1) through an opening (12). A partition (31) divides resonance chamber into first and second portions, and the first and second resonance chamber portions communicate with one another through a connection passage (3) formed in partition (31). A disk-like seal member (4) is disposed within connecting passage (3) and regulates flow between the resonant chamber portions through a negative pressure source (54).

As such, it is submitted that JP 03-229908 is the type of silencer noted in the Background of the Invention section of the present application, namely, a system including resonant chambers for noise attenuation. Applicant notes that the effectiveness of such a system is dependent primarily upon the enclosed space, or volume, of the resonant chambers rather than a path length between the air intake and the resonant chambers. It is therefore respectfully submitted that Mondek in view of JP 03-229908 do not describe or suggest the air silencer as described in the instant specification and as recited in the present claims.

Claim 1 recites an air intake silencer including “at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough” and “at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

Mondek in view of JP 03-229908 neither describe nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, Mondek describes an engine shroud including an air intake duct, and JP-60-022021 describes resonant chambers in flow communication with an air intake for attenuating noise within the volume of the resonant chambers. Neither Mondek nor JP-03-229908 describe or suggest cancellation of noise within an air intake pipe.

For the reasons set forth above, Claim 1 is submitted to be patentable over Mondek in view of JP 03-229908.

Claims 2, 3 and 5-8 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2, 3 and 5-8 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2, 3 and 5-8 likewise are patentable over Mondek in view of JP 03-229908.

Claim 9 recites a cover for an outboard motor including a lower cover, an upper cover configured for attachment to said lower cover, and “at least one air intake silencer attached to one of said upper cover and said lower cover and comprising at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough, and at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.”

Mondek in view of JP 03-229908 neither describe nor suggests an air intake silencer having a tuning passage in fluid communication an inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through the inlet pipe. Rather, Mondek describes an engine shroud including an air intake duct, and JP-03-229908 describes resonant chambers in flow communication with an air intake for attenuating noise within the volume of the resonant chambers. Neither Mondek in view of JP 03-229908 describe or suggest cancellation of noise within an air intake pipe.

Claim 9 is therefore submitted to be patentable over Mondek in view of JP 03-229908.

Claims 10-12, 16-18 and 20 depend, directly or indirectly, from independent Claim 9. When the recitations of Claims 10-12, 16-18 and 20 are considered in combination with the recitations of Claim 9, Applicants submit that dependent Claims 10-12, 16-18 and 20 likewise are patentable over Mondek in view of JP 03-229908.

Claim 21 recites an outboard motor engine including “at least one air inlet for engine intake air,” and “an air intake silencer coupled to said air inlet, said air intake silencer comprising at least one air inlet pipe coupled to said air inlet and at least one tuning tube in flow communication with said air inlet pipe, said air inlet pipe and said tuning tube configured to cancel a portion of sound traveling through said air inlet pipe.”

Mondek in view of JP 03-229908 neither describe nor suggest an outboard engine including an air intake silencer comprising at least one air inlet pipe coupled to an air inlet and at least one tuning tube in flow communication with the air inlet pipe, the air inlet pipe and the tuning tube configured to cancel a portion of sound traveling through the air inlet pipe. Rather, Mondek describes an engine shroud including an air intake duct, and JP-03-229908 describes resonant chambers in flow communication with an air intake for attenuating noise within the volume of the resonant chambers. Neither Mondek nor JP 03-229908 describe or suggest cancellation of noise within an air intake pipe.

For the reasons set forth above, Claim 21 is submitted to be patentable over Mondek in view of JP 03-229908.

Claims 23, 25-27 and 29 depend, directly or indirectly, from independent Claim 21. When the recitations of Claims 23, 25-27 and 29 are considered in combination with the recitations of Claim 21, Applicants submit that dependent Claims 23, 24, 25, 27 and 29 likewise are patentable over Mondek in view of JP 03-229908..

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1-3, 5-12, 16, 18-21, 23, 25-27 and 29 as being unpatentable over Mondek in view of JP 03-229908 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



Bruce T. Atkins
Registration No. 43,476
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Justen et al.

Serial No.: 09/714,316

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For: AIR INTAKE SILENCER

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: Examiner: A. Vasudeva
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I certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on _____, 2002.

Bruce T. Atkins
Reg. No. 43,476

SUBMISSION OF MARKED UP CLAIMS AND PARAGRAPHS

Hon. Assistant Commissioner for Patents
Washington, D.C. 20231

In furtherance of the response to the Office Action dated October 19, 2001 submitted separately herewith, Applicants hereby submit the following marked up paragraphs and claims:

IN THE SPECIFICATION

From page 7, lines 26-31:

In further alternative embodiments, more than one [of] intake silencer, such as silencers 30, 70 or 80 (shown and described above) or combinations of air intake silencers 30, 70, or 80, are formed integrally into the same or different walls of upper or lower halves, respectively, of an engine cover. In still further embodiments, one or more air intake silencers are separately formed and attached to the upper or lower halves, respectively of the engine cover.

IN THE CLAIMS

1. (once amended) An air intake silencer comprising:

at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough; and

at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said [air] inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.

2. (once amended) An air intake silencer in accordance with Claim 1 wherein said air [intake] inlet pipe is straight.

7. (once amended) An air intake silencer in accordance with Claim 1 wherein said at least one air inlet [tube] pipe and said at least one tuning tube are integrally formed.

8. (once amended) An air intake silencer in accordance with Claim 7 wherein said air inlet [tube] pipe and said at least one tuning tube comprise an air intake manifold.

9. (once amended) A cover for an outboard motor comprising:

a lower cover;

an upper cover configured for attachment to said lower cover; and

at least one air intake silencer attached to one of said upper cover and said lower cover and comprising:

at least one air inlet pipe comprising a first end, a second end, and an inlet passage therethrough; and

at least one tuning tube comprising a first end, a second end, and a tuning passage therethrough, said tuning passage in fluid communication with said [air] inlet passage and extending for a length selected to cancel noise of at least a first selected frequency passing through said inlet pipe.

10. (once amended) A [motor] cover in accordance with Claim 9 wherein said upper cover comprises a top wall, said at least one air intake silencer attached to said top wall.

11. (once amended) A [motor] cover in accordance with Claim 9 wherein each of said upper cover and said lower cover comprises at least one side wall, said at least one air intake silencer attached to at least one side wall of said upper cover and said lower cover.

12. (once amended) A [motor] cover in accordance with Claim 11 wherein said lower cover comprises a bottom wall, said at least one air intake silencer attached to said bottom wall.

13. (once amended) A [motor] cover in accordance with Claim 9 wherein said at least one air intake silencer is integrally formed with said cover.

14. (once amended) A [motor] cover in accordance with Claim 9 wherein said at least one air inlet pipe and said at least one tuning tube comprise an air intake manifold.

15 (once amended) A cover[An air intake silencer] in accordance with Claim 9 wherein said air [intake] inlet pipe is straight.

16. (once amended) A cover [An air intake silencer] in accordance with Claim 15 wherein said tuning tube comprises a first segment in flow communication with said inlet passage, a second segment in flow communication with said inlet passage, and a third segment extending between said first segment and said second segment and in flow communication with said first segment and said second segment.

17. (once amended) A cover [An air intake silencer] in accordance with Claim 16, said first segment and said second segment are separated from one another along an axis of said inlet pipe.

18. (once amended) A cover [An air intake silencer] in accordance with Claim 9 wherein said tuning tube and said air inlet pipe have substantially equal diameters.

19. (once amended) A cover [An air intake silencer] in accordance with Claim 9 further comprising at least another tuning tube, said at least another tuning tube in a wrap-around relationship with said at least one tuning tube.

20. (once amended) A cover [An air intake silencer] in accordance with Claim 9 wherein said at least one air inlet [tube] pipe and said at least one tuning tube are integrally formed.

21. (once amended) An outboard motor engine comprising:

at least one air inlet for engine intake air; and

an air intake silencer coupled to said air inlet, said air intake silencer comprising at least one air inlet pipe coupled to said air inlet [pipe] and at least one tuning tube in flow communication with said air inlet pipe, said air inlet pipe and said tuning tube configured to cancel a portion of sound traveling through said air inlet pipe.

22. (once amended) An outboard motor engine in accordance with Claim 21 wherein said air [intake] inlet pipe is straight.

23. (once amended) An outboard motor engine in accordance with Claim 21 wherein said tuning tube comprises a first segment in flow communication with an inlet pipe passage, a second segment in flow communication with said inlet pipe passage, and a third segment

extending between said first segment and said second segment and in flow communication with said first segment and with said second segment.

27. (once amended) An outboard motor engine in accordance with Claim 21 wherein said at least one air inlet [tube] pipe and said at least one tuning tube are integrally formed.

28. (once amended) An outboard motor engine in accordance with Claim 27 wherein said air inlet [tube] pipe and said at least one tuning tube comprise an air intake manifold.

Respectfully Submitted,



Bruce T. Atkins
Registration No. 43,476
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070